DOE/NV/25946--551

TECHNICAL PAPER

56th DEFENSE WORKING GROUP ON NONDESTRUCTIVE TESTING

December 9–11, 2008

Modular Optical PDV System

Araceli Rutkowski, David L. Esquibel

National Security Technologies, LLC, Los Alamos Operations
182 East Gate Drive
Los Alamos, NM 87544
505-663-2005

esquibdl@nv.doe.gov

ABSTRACT

A modular optical photon Doppler velocimetry (PDV) detector system has been developed by using readily available optical components with a 20-GHz Miteq optical detector into eight channels of single-wide modules integrated into a 3U rack unit (1U = 1.75 inches) with a common power supply. Optical fibers were precisely trimmed, welded, and timed within each unit. This system has been used to collect dynamic velocity data on various physics experiments. An optical power meter displays the laser input power to the module and optical power at the detector. An adjustable micro-electromechanical system (MEMS) optical attenuator is used to adjust the amount of unshifted light entering the detector. Front panel LEDs show the presence of power to the module. A fully loaded chassis with eight channels consumes 45 watts of power. Each chassis requires 1U spacing above and below for heat management. Modules can be easily replaced.

This work was done by National Security Technologies, LLC, under Contract No. DE-AC52-06NA25946 with the U.S. Department of Energy.